

REMARKS

Existing claim 16 has been amended so as to direct the scope of protection to a digital tuner including a single zero or near zero intermediate frequency changer. Also, the reference oscillator has been specified as being a fixed frequency reference oscillator.

New claim 31 defines a combination of the features from the claims 16, 26 and 27. Claim 31 is thus limited to the first and second oscillators being within a phase locked loop including a programmable divider having selectable divisors of 2, 3 and 4.

The new claim 43 defines the combination of features from the claims 16 and 26 together with the additional feature that the first control loop has a bandwidth which covers the first frequency band. This feature was not previously in the claims but may be found, for example, in the sentence beginning at line 8 of the large paragraph on page 8 of the specification.

Turning now to the Examiner's "Response to Arguments" submitted in the previous Office Action response, with particular regard to claim 16, the Examiner seems to be suggesting that claim 16 is obvious in view of the combination of Nolde and the AAPA in Figure 2 of our application. In particular, he seems to be suggesting that it would be obvious to substitute the oscillator arrangement of Nolde in to the Figure 2 arrangement and use the reference oscillator of Figure 2 in place of the pilot tone in the second phase-locked loop of Nolde. The Examiner appears to be suggesting that the use of the reference oscillator of Figure 2 to replace the pilot tone is a matter of "design choice" related to frequency step size and phase noise outside the loop bandwidth.

Nolde is specifically concerned with reducing "the cost and designing efforts for a circuit having two phase control loops" as stated in column 1, lines 41 to 43 of Nolde. In column 1, line 62 to column 2, line 3 of Nolde, it is stated that this is specifically achieved by omitting a

stable fixed frequency reference oscillator, which also avoids the need for adjusting the reference oscillator. The disclosure of Nolde is somewhat confused in that it refers to “the voltage-controlled oscillator which would otherwise be additionally required” (column 1, lines 67 and 68). In fact, this passage would appear to be slightly in error in that it is actually the fixed frequency reference oscillator which would otherwise be required.

Thus, when the disclosure of Nolde is properly interpreted, Nolde is telling the person skilled in the art to produce an oscillator arrangement comprising two phase-locked loops but specifically without having a fixed frequency reference oscillator. In other words, Nolde is specifically and explicitly teaching away from the presence of a fixed stable reference oscillator. This is fully confirmed by the fact that the independent claims in Nolde specifically and explicitly require that the (so-called) reference oscillator is phase-locked or synchronized to the pilot signal or pilot tone extracted from the received FM signal.

The Examiner’s contention that the oscillator arrangement of Nolde could be substituted in the arrangement of Figure 2 of the application with the pilot tone being replaced by the signal from the local fixed frequency oscillator therefore goes completely against the teachings of Nolde. In particular, Nolde explicitly teaches that there should be no stable fixed frequency oscillator and, instead, the “middle” oscillator should be phase-locked to a pilot tone extracted from the received FM signal. We would therefore submit that the Examiner’s response to our arguments is fundamentally flawed and incorrect in that it seeks to reverse the actual meaning and disclosure of Nolde and so is logically untenable.

Turning now to new claim 31, the Examiner attempts to dismiss the features of the first programmable divider having selectable divisors of 2, 3 and 4 with reference to Gardner in the

passage towards the bottom of page 10 of the latest Office Action. The Examiner suggests that it would have been obvious "to use any integer value for the divider to obtain the desired frequencies". In other words, the Examiner can find no prior art to support the specific selection defined in claim 31 but he does not consider any selection to have inventive merit.

It is respectfully submitted that the divisors specified in claim 31 have not been selected arbitrarily but have been chosen from among an almost infinite range for technical reasons in order to provide an improvement in performance. By choosing these particular divisors for the first programmable divider, the frequency of the second oscillator can be kept outside the input signal bandwidth but the control loop bandwidth of the phase-locked loop including the first and second oscillators may be made very wide. This endows the first oscillator with a very low phase noise characteristic, effectively determined by the second oscillator, and makes the whole oscillator arrangement substantially immune to injection pulling. Use of the specified divisors thus achieves a technical result with considerable advantages in terms of the tuner performance. Further, as implicitly acknowledged by the Examiner in his comments on claim 27 in the latest Office Action, there is no disclosure whatever in the prior art of the use of such divisors in the context of a digital tuner frequency changer to achieve such advantages.

Turning now to new claim 43, as mentioned above, this introduces a feature which was not previously present in any of the claims but was clearly disclosed in the application as filed. Claim 43 thus requires the first and second oscillators to form part of a first phase-locked loop with a first control loop having a bandwidth which covers the first frequency band containing the input signals available for reception. This feature is neither disclosed nor suggested in any of the prior art cited by the Examiner and, so far as we are aware, is not disclosed or suggested in any prior art at

all. This feature achieves the advantage set out in the large paragraph on page 8 of our application "that the free-running phase noise of the first oscillator is greatly reduced by the phase-locking to the second oscillator". In the absence of any prior art disclosure of this feature, new claim 43 cannot be held to be unpatentable and must therefore be patentable.

Our check in the amount of \$342.00 for 19 dependent excess claims is enclosed.

Petition is hereby made for a one-month extension of the period to respond to the outstanding Official Action to September 5, 2004. A check in the amount of \$110.00, as the Petition fee, is enclosed herewith. If there are any additional charges, or any overpayment, in connection with the filing of the amendment, the Commissioner is hereby authorized to charge any such deficiency, or credit any such overpayment, to Deposit Account No. 11-1145.

Wherefore, a favorable action is earnestly solicited.

Respectfully submitted,

KIRSCHSTEIN, OTTINGER, ISRAEL & SCHIFFMILLER, P.C.

Attorneys for Applicant(s)

489 Fifth Avenue

New York, New York 10017-6105

Tel: (212) 697-3750

Fax: (212) 949-1690



Alan Israel

Reg. No. 27,564